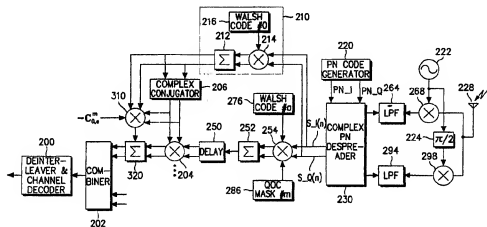




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(54) Title: DEVICE AND METHOD FOR CANCELLING CODE INTERFERENCE IN A CDMA COMMUNICATION SYSTEM			



(57) Abstract

A device and method for cancelling code interference in a receiver of a CDMA (Code Division Multiple Access) communication system simultaneously using orthogonal codes and quasi-orthogonal codes are provided. In a receiver according to an embodiment of the present invention, a channel estimator (210) produces a channel estimation value of a pilot channel signal spread by an orthogonal code (216) through despreading (214). A quasi-orthogonal channel receiver (222, 224, 228, 268, 298) receives a channel signal spread by a quasi-orthogonal code, despreads (220) the channel signal, demodulates (204) the despread channel signal by use of the channel estimation value, and provides an output. An interference estimator (310) estimates an interference value of the pilot channel signal with the channel signal spread by the quasi-orthogonal code by obtaining a correlation value between the orthogonal code corresponding to a pilot channel and the quasi-orthogonal code corresponding to a quasi-orthogonal channel. An interference canceller (320) cancels the estimated interference from the output of the quasi-orthogonal channel receiver.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC⁷: H04J 13/02; H04B 15/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC⁷: H04B; H04J; H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

IEEE Trans. on Comm., IEEE Comm. Letters

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CAVALLINI et al. 'Chip-Level Differential Encoding/Detection of Spread-Spectrum Signals for CDMA Radio Transmission over Fading Channels.' IEEE Transactions on Communications, Vol. 45, No. 4, April 1997, p. 456-463	1-15
A	US 5 659 573 A (BRUCKERT et al.) 19 August 1997 (19.08.97) figs.; abstract; col. 3, line 58 - col. 4, line 30; col. 7, line 5 - col. 8, line 7 ----	1-15

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Patent document cited in search report			Publication date	Patent family member(s)		Publication date	
US	A	5659573	19-08-1997	BR	A	9506385	16-09-1997
				CA	AA	2176945	11-04-1996
				CN	A	1136378	20-11-1996
				EP	A1	732022	18-09-1996
				FI	A	962326	04-06-1996
				FI	A0	962326	04-06-1996
				IL	A0	114836	08-12-1995
				IL	A1	114836	27-12-1998
				JP	T2	9507014	08-07-1997
				PL	A1	314846	30-09-1996
				WO	A1	9610879	11-04-1996
				US	A	5619524	08-04-1997